



METHANE FROM LANDFILLS

FREQUENTLY ASKED QUESTIONS

What is methane?

Methane is a colorless, odorless flammable gas. It is explosive when the levels in air are between 5 percent (50,000 parts per million (ppm)) and 15 percent (150,000 ppm) per volume. Methane will not ignite above and below these levels.

How is methane produced?

Methane occurs both naturally and from industrial processes. Natural sources include wetlands, oceans, freshwater bodies, and wildfires. Industrial sources include manure handling operations, natural gas and petroleum systems, coal mining, wastewater treatment plants, and solid waste landfills.

The United States Environmental Protection Agency (U.S. EPA) reports that landfills are the largest human related source of methane emissions in the United States. The formation of methane within a landfill depends on certain conditions including moisture content and temperature; anaerobic conditions (lacking oxygen); and a source of organic material.

What types of wastes contribute to methane formation in landfills?

Municipal solid waste including yard waste, household waste, food waste and paper is a major contributor to methane formation in landfills. Other waste streams that contain organic material may include waste from pulp and paper mill operations and sludges from municipal wastewater treatment plants.

How do landfills check for methane?

Different methods can be used to check for methane and are selected based on site-specific needs. Methane can be detected and measured with portable or stationary continuous air monitors. Air sampling and subsequent laboratory analysis can also be conducted.

How can methane be controlled in the landfill environment?

Methane and other landfill gases can be controlled by installing an active or passive gas management system. The type of system is selected based on site-specific needs. An active system can work to pull out and burn the methane, usually in a single large flare. A passive system can collect and convey the methane to vents that release the methane to the atmosphere. When collected, methane can also be used as an energy source. If used as an energy source, the landfill gas may need to be processed and treated.

Why is it important to control methane?

Because methane can form an explosive mixture in air at levels as low as 5 percent it is important to prevent it from migrating away from a landfill and accumulating in buildings and other structures. Methane is also considered a potent greenhouse gas and can contribute to global warming. The U.S. EPA's Landfill Methane Outreach Program has established a voluntary assistance program that helps to reduce methane emissions from landfills by encouraging the recovery and use of landfill gas as an energy resource.

Does Maine have any health guidelines for methane?

Maine has not established health guidelines for methane. In 2006, the American Conference of Governmental Industrial Hygienists (ACGIH®) established an occupational exposure value for methane that is believed to be protective against potential health effects. The ACGIH® Threshold Limit Value (TLV®) for methane is 1000 ppm (0.1 percent volume). The TLV® is based on a time-weighted average exposure concentration for a typical 8-hour workday and a 40-hour workweek. The value is an occupational guideline only and is not intended to be a regulatory standard or law.

What other resources are available if I would like additional information on methane?

The Maine Department of Environmental Protection (<http://www.maine.gov/dep/index.shtml>), the American Conference of Governmental Industrial Hygienists (<http://www.acgih.org/home.htm>), the United States Environmental Protection Agency (<http://www.epa.gov>), the Occupational Health and Safety Administration (<http://www.osha.gov>), and the National Institute for Occupational Safety and Health (<http://www.cdc.gov/niosh/>) can offer additional information on methane.

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References

American Conference of Governmental Industrial Hygienists. 2004. Aliphatic Hydrocarbon Gases: Alkanes [C1–C4].

United States Environmental Protection Agency. 2007. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, EPA 430-R-07-002.